

REMARKS

In the July 26, 2005 Office Action, the Examiner noted that claims 7-9 and 12-14 were pending in the application, and rejected claims 7-9 and 12-14 under 35 U.S.C. § 103(a). In rejecting the claims, U.S. Patents 6,114,862 to Tartagni et al. and 4,929,893 to Sato et al. were cited. Claims 7, 8, and 13 have been amended. Support for the amended claims can be found at paragraph [0011] on page 3 of the Substitute Specification and at paragraph [0017] on page 4 of the Substitute Specification. See also FIGs. 1 and 2. Claims 12 and 14 have been cancelled. Thus, claims 7-9 and 13 remain in the case. The Examiner's rejections are traversed below.

The Application

The subject application is directed to a method for detecting the position or the surface structure of an object, such as a mechanical workpiece. For example, when such an object is placed over an array of capacitive individual sensors having a lateral extent that is at most half the lateral extent of the object to be detected, at least one of the sensors experiences a capacitive disturbance at its surface through the presence of the object. As described in paragraph [0008] on page 2 of the Substitute Specification, the disturbance of the sensor is then electronically evaluated and processed to form an image of the object.

In at least one embodiment of the invention, the method detects the position and the orientation of terminal pins. The method is particularly suited for application in automatic component mounting machines that have a machine tool and a component provider. The fingerprint sensors, which can be integrated, can be mounted "straight away" at the component provider or in the machine tool. Such mounting allows the position and orientation of terminal pins of electric components to be checked at the beginning of a processing cycle. As a result, it is possible to dispense with subsequent corrections.

The Prior Art**U.S. Patent No. 6,114,862 to Tartagni et al.**

Tartagni et al. is directed to a capacitive distance sensor used as a fingerprint sensor to detect the identity of persons from their fingerprints "by measuring small distances between the sensor device and an object" (column 1, lines 63-65), i.e., the surface of the skin on the fingertip. The sensor includes a number of cells, which are arranged in an array and are electronically coupled with an electronic circuit to read the detected fingerprints. A distance between a first

and second capacitor plate and a third capacitor plate formed by a skin surface is detected to conduct fingerprint measuring (see column 4, lines 33-37; see also Fig. 2). According to Tartagni et al., the sensor can detect a solid, a liquid, a gas and "plasma-based things" in addition to fingerprints (see column 3, lines 17-20).

U.S. Patent No. 4,929,893 to Sato et al.

Sato et al. is directed to a wafer prober with a probe card for examination of chips formed on a wafer. The prober includes a wafer chuck for holding the wafer, contact needles attached to the probe card and a positioning system for adjusting the relative position between the probe card and the wafer to bring the contact needles in contact with relevant bonding pads on an examined chip. To accurately align the contact needs and the bonding pads, the wafer prober further includes a vision system having two television cameras for observing reference marks and bonding pads and contact needles. To measure angular orientation of the whole wafer, the wafer prober also includes a capacitive sensor, which can be moved along the circumference of the wafer such that the outer configuration of the wafer as well as height of the wafer in a vertical z-direction can be measured. According to Sato et al., the angular orientation is measured by detecting the orientation of a flat portion of the wafer (see column 10, lines 6-12).

Rejections under 35 U.S.C. § 103

On page 3 of the Office Action, claims 7-9 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tartagni et al. in view of Sato et al. Claims 12 and 14 have been cancelled. Thus, the rejection with respect to claims 12 and 14 is moot.

It is respectfully submitted that independent claim 7 is patentable over Tartagni et al. in view of Sato et al., as neither Tartagni et al. nor Sato et al., taken individually, or in combination, teaches or suggests all of the features recited in the claims.

For example, Tartagni et al. does not disclose or suggest, "wherein said evaluating detects at least one of the position and surface structure of terminal pins of the electric component" and also does not disclose or suggest, "wherein said terminal pins protrude from a body of the electric component," as recited in currently amended independent claim 7.

The Examiner appears to allege that the bonding pads of a bare IC located in a wafer correspond to terminal pins. Applicants have amended independent claim 7 to include the recitation, "wherein said terminal pins protrude from a body of the electric component."

In contrast to the method disclosed in the subject application, Tartagni et al. discloses a “way” in which a local distance “d” between first and second capacitor plates of a cell and a third capacitor plate formed by a skin surface is detected (see column 4, lines 38-42). Thus, in Tartagni et al., the detection is simply with respect to a distance between capacitor plates and is not related to terminal pins of an electric component, as disclosed in the subject application.

Moreover, Tartagni et al. simply describes a method of calculating *distance* between the plates. Applicants respectfully submit that merely calculating distance between plates is not tantamount to or related to detecting at least one of a *position and surface structure* of terminal pins of an electric component.

In contrast to the present invention, Sato et al. discloses a capacitance type sensor for measuring the outer configuration of a wafer and the position (height) of the wafer in the Z direction. Although position is measured in Sato et al., the position is with respect to a wafer and is not a position or surface structure of terminal pins, as disclosed in the subject application. Applicants respectfully submit that measuring the position of a wafer is not tantamount to or related to measuring at least one of a position and surface structure of terminal pins of an electric component.

Moreover, it is respectfully submitted that the method of detection taught by Sato et al. cannot be used to modify Tartagni et al. due to the differences in their capacitive sensing methods. In particular, since Sato et al. does not employ a plurality of sensors, only an edge of a wafer can be detected. On the other hand, Tartagni et al. relies on the use of multiple sensors to detect a fingerprint or similar object. Obtaining transversal position measurement using the sensor taught by Sato et al. requires a position system that carries the capacitive sensor along the wafer edge, because the single cell sensor of Sato et al. has no transversal spatial resolution. If Tartagni et al. and Sato et al. were combined, the primary method of operation of one of the references would have to be changed. Therefore, the references cannot be properly combined to reject the claims.

In light of the foregoing, it is respectfully submitted that neither Tartagni et al. nor Sato et al., taken individually, or in combination, teaches or suggests the above-identified feature of claim 7 discussed above. As claims 8, 9, and 13 depend from claim 7, it is submitted that claims 8, 9, and 13 are patentable over Tartagni et al. in view of Sato et al., for at least the reasons discussed above with respect to claim 7.

Summary

It is submitted that the references cited by the Examiner, taken individually or in combination, do not teach or suggest the features of the present claimed invention. Thus, it is submitted that claims 7-9 and 13 are in a condition suitable for allowance. Reconsideration of the claims is respectfully requested, and an early Notice of Allowance is earnestly solicited.

Finally, if there are any formal matters remaining after the Amendment, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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